

replacement sheet

ACR 2691 R

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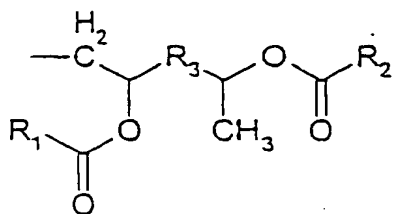
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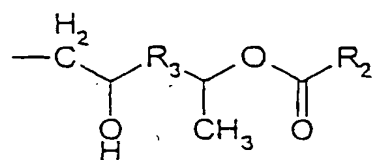
Claims

(52)

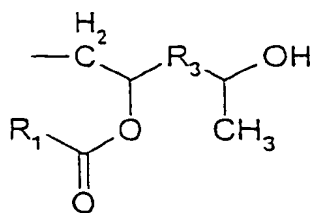
1. Quaternary ammonium compounds of the formula $R_4[R_5R_6N^+Z]_n X^-$, wherein Z is covalently bonded to the nitrogen atom and selected from the group of the following formulae (I-IV)



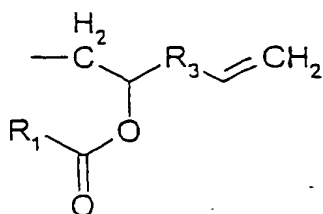
(I),



(II)



(III),



(IV),

10

and the isomers of any of these compounds, wherein

R_1 and R_2 are independently selected from linear or branched, saturated or unsaturated C_{6-22} hydrocarbyl,

R_3 is nothing or C_{1-20} hydrocarbyl,

R_4 is C_{1-6} alkyl, C_{1-6} alkylene, or independent Z,

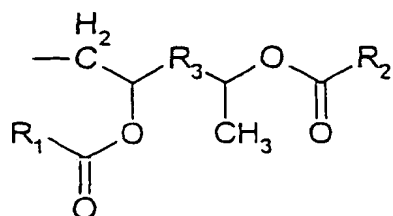
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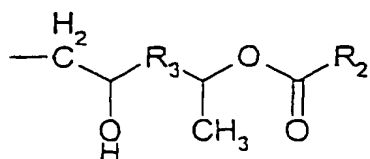
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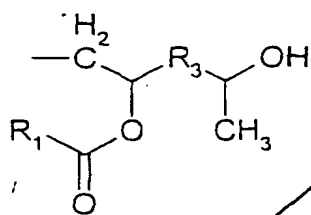
wherein Z is covalently bonded to the nitrogen atom, and of the following formulae (I-IV)



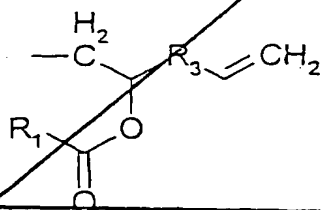
(I).



(II)

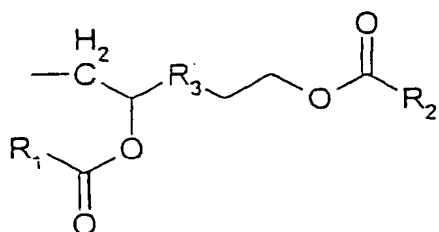


(III)

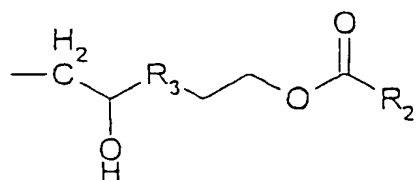


(IV)

isomers thereof with the formulae:



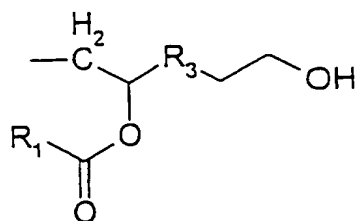
(Ia)



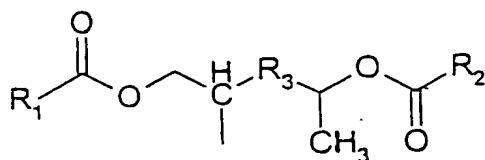
(IIa)

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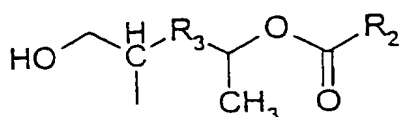
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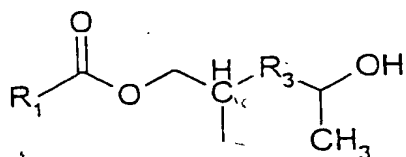
(IIIa)



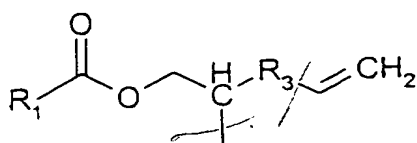
(Ib),



(IIb)

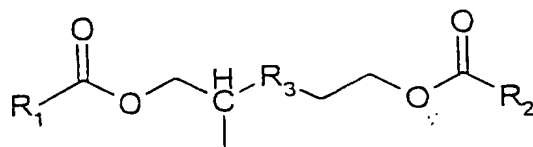


(IIIb)

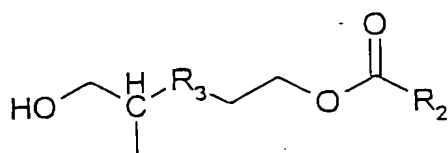


(IVb)

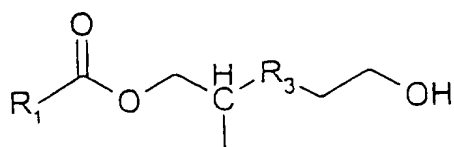
5



(Ic)



(IIc), and



(IIIc)

wherein,

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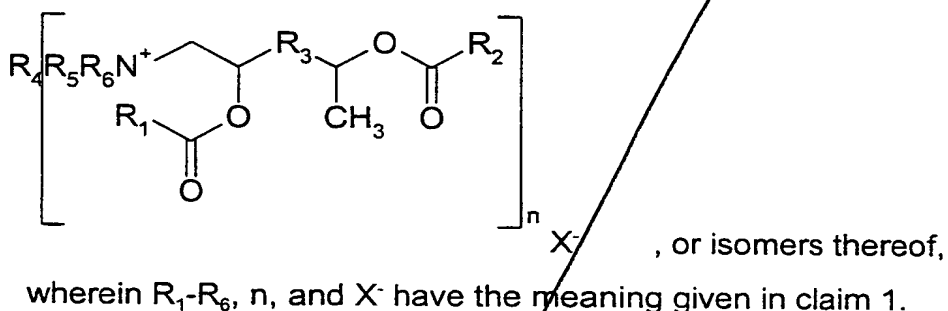
R₅ is H, C₁₋₆ alkyl, independent Z, or the residue of the quaternizing agent, such as C₁₋₃₀ alkyl or alkenyl, preferably, C₁₋₇ alkyl or alkenyl,

R_6 is C_{1-6} alkyl or independent Z,

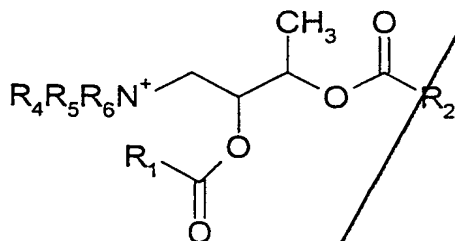
n is 1 or 2, and

5 X⁻ is an ion selected from Cl⁻, Br⁻, I⁻, F⁻, CH₃SO₄⁻, C₂H₅SO₄⁻, H₂PO₄⁻, HPO₄²⁻, PO₄³⁻, H₂PO₃⁻, HPO₃²⁻, H₂PO₂⁻, HPO₂²⁻, nitrate⁻, formate⁻, acetate⁻, propionate⁻, tartrate⁻ and benzoate⁻, wherein the total charge of the anions equals the total charge of the cations.

10 2. Compounds according to claim 1 of the formula



3. Compounds according to claim 2 of the formula



15 O X^- , or isomers thereof,
wherein R_1 , R_2 , R_4 - R_6 and X^- have the meaning given in claim 1.

4. ~~Compounds according to any one of claims 1-3 wherein R₁ and R₂ are independently selected from linear or branched, saturated or unsaturated C₁₂₋₁₈ alkyl groups.~~

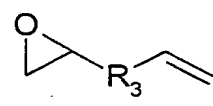
5. Compounds according to any one of the preceding claims, characterized in that R_4 and R_6 are methyl.

5 6. Compounds according to any one of the preceding claims wherein X^- is chloride, methyl sulfate or ethyl sulfate.

10 7. Intermediates for making one or more of the compounds of the preceding claims according to the formula $R_4[R_6NZ]_n$, wherein R_4 , R_6 , n , and Z have the meaning given in claim 1.

8. Compositions comprising one or more of the compounds according to any one of the preceding claims.

9. A process to make the compounds of claim 1 comprising the steps of:

- 15 - reacting an unsaturated epoxide of the formula  with an amine or protonated amine of the formula $R_4[R_5R_6N]_n$ or $R_4[R_5R_6N^+H]_n X^-$, wherein R_3 , R_4 , R_5 , R_6 , n , and X^- have the meaning given in claim 1, and
- 20 - esterification of the intermediate with, on average, 1-2 moles of fatty acid derivatives, comprising the moieties $R_1-C(O)-$, $R_2-C(O)-$ or mixtures thereof, per mole of OH groups of the intermediate,
- an optional conventional quaternization either before or after said esterification step.

25 10. A process according to claim 9, characterized in that a trialkylamine is reacted with the unsaturated epoxide.

11. A process according to claim 9 or 10, characterized in that a product according to any one of claims 2-6 is formed.

Sub

12. Use of a compound or composition according to any one of claims 1-8 as a fabric softener.
- 5 13. Use according to claim 12 wherein the compound is used in combination with a conventional performance booster selected from the group consisting of cationic and non-ionic surfactants.

Sub
a2

ADD
a3

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